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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/677,058	09/30/2003	Ernest Tsui	884.927US1	8098

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EXAMINER	
WANG, TED M	

ART UNIT	PAPER NUMBER
2611	

NOTIFICATION DATE	DELIVERY MODE
05/28/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/677,058	TSUI ET AL.	
	Examiner	Art Unit	
	TED M. WANG	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 January 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *2,3,6,7,9,10,25,27 and 28* is/are allowed.

6)☒ Claim(s) *13-16 and 18-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. The indicated allowability of claims 13-16 and 18-23 are withdrawn in view of the previously cited reference(s) to US 6,819,706. Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 13, 15, 16, 18, 19, 20 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over **"Lim (US 6,819,706)"** in view of Langberg et al. (US 5,852,630).

- With regard claim 13, Lim discloses a method comprising:

  shifting a center frequency of selected ones of a plurality of received signals by selected amounts to provide a plurality of shifted signals located in a frequency domain (Fig.5 Elements 10, 20, 60, 80 and 90, Fig.6 element 90, column 7 lines 25-28 and 60-67, column 3 lines 29-45, where the receiving unit 20 for receiving the RF signal received via the antenna 10 from a mobile terminal device, limiting the band of the received signal, and amplifying the filtered signal to a predetermined level;

an analog frequency down-converter 60 for down-converting the multi-carrier (three frequency assignment) RF signal outputted from the receiving unit 20 into arbitrary IF signals.);

combining the plurality of shifted signals into a composite signal centered at a selected frequency (Fig.6 elements 90 and 97, where since the system can be processed as QPSK receiver, it is inherent that the shifted signals are composite signals), the selected frequency is approximately zero cycles-per-second (column 3 lines 30-36, where the downconverted IF signal can be any arbitrary IF signal. Examiner considers that the "any arbitrary IF signal" is inherently including zero cycles-per-second frequency (also refer to paragraph 14 of the instant application, 2005/0069046));

sampling the composite signal with a single analog-to-digital converter to provide a multiplicity of digital samples (Fig.5 element 71); and

providing the multiplicity of digital samples to a plurality of digital bandpass filters (Fig.5 elements 70, 72-74 and column 4 lines 8-29, where the digital bandpass filter, FIR filter, is used to filter the received digital signal to the assigned frequency assignment output, 0FA, 1FA and 2FA, respectively.);

wherein the composite signal includes a plurality of protocols associated with the plurality of received signal (column 2 lines 28-38, where the term "plurality of the protocols" is interpreted as different

frequency bands (page 2 lines 1-2 of the instant application)). Lim teaches the antenna 10 and the receiving unit 20 are used commonly for all frequency assignment (frequency band of the all frequency assignments) and the first to third RF down-converters 30, 31 and 32 and the first to third analog IF processors 40, 41 and 42 are used by each frequency assignment. It is inherent that the composite signals received from antenna 10 includes a plurality of protocols associated with the plurality of received signal.

Lim discloses all of the subject matter as described above except for the method written by a software program embodied in a machine-accessible medium.

However, Langberg et al. teaches that the method and apparatus for a transceiver warm start activation procedure with precoding can be implemented in software stored in a computer-readable medium. The computer-readable medium is an electronic, magnetic, optical, or other physical device or means that can be contain or store a computer program for use by or in connection with a computer-related system or method (column 3, lines 51-65). One skilled in the art would have clearly recognized that the method of **"Lim"** would have been implemented in a software. The implemented software would perform same function of the hardware for less expense, adaptability, and flexibility. Therefore, it would have been obvious to have used the software in **"Lim"** as taught by

Langberg et al. in order to reduce cost and improve the adaptability and flexibility of the communication system.

- With regard claim 15, Lim discloses selecting a single sampling frequency rate for the composite signal (Fig.5 element 71, ADC, where since there is only one ADC it is inherent that a single frequency rate is selected for the composite signal) and determining a down conversion frequency for selected radio frequency signals associated with the plurality of received signals (Fig.5 element 60 and column 8 lines 27-32).
- With regard claims 16, Lim further discloses the pluralities of shifted signals are located substantially sequentially in the frequency domain (Fig.5 Elements 10, 20, 60, 80 and 90, Fig.6 element 90, column 7 lines 25-28 and 60-67, column 3 lines 29-45, where the receiving unit 20 for receiving the RF signal received via the antenna 10 from a mobile terminal device, limiting the band of the received signal, and amplifying the filtered signal to a predetermined level; an analog frequency down-converter 60 for down-converting the multi-carrier (three frequency assignment) RF signal outputted from the receiving unit 20 into arbitrary IF signals.)
- With regard claim 18, which is an apparatus claim related to claim 13, all limitation is contained in claim 13. The explanation of all the limitation is already addressed in the above paragraph.
- With regard claim 19, Lim further discloses wherein the analog stage further comprises:

A plurality of sections corresponding to the plurality of received signals (Fig.5 elements 80 and 90 and Fig.6),

wherein selected ones of the sections include at least one bandpass filter and a mixer (Fig.5 element 80, Fig.6 elements 91-93).

- With regard claim 20, Lim further discloses wherein the analog stage further comprises: a combiner (Fig.6 element 97, where examiner consider the adder 97 is a combiner) selected from a power combiner, a mixer (column 3 lines 46-52, where the mixer is included inside the element 60, downconverter), and an adder (Fig.6 element 97).
- With regard claim 22, further discloses a plurality of digital processing modules corresponding to the plurality of received signals (Fig.5 elements 72-74), wherein selected ones of the digital processing modules include at least one of a digital bandpass filter (Fig.5 elements 70, 72-74 and column 4 lines 8-29, where the digital bandpass filter, FIR filter, is used to filter the received digital signal to the assigned frequency assignment output, 0FA, 1FA and 2FA, respectively.) and a down converter (column 4 lines 15-29, where the mixer is considered as the down converter).

4. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawanabe (US 7,054,397) in view of Lim (US 6,819,706) and Langberg et al. (US 5,852,630).

- With regard claim 14, Kawanabe discloses

shifting a center frequency of selected ones of a plurality of received signals by selected amounts to provide a plurality of shifted

signals located in a frequency domain (Fig. 2, antennas 107-1 ..n receive a plurality of signals which are frequency shifted by 111, col. 4, lines 46-48),

combining the plurality of shifted signals into a composite signal centered at a selected frequency (Fig.2 elements 115, 117 and 119, and Fig.5 element 119, where Examiner considers that the double super heterodyne downconverters (mixers 149 and 155) circuit along with filter 159 is a part of the combining process circuitry to select the curve a of Fig.6B (by filter 159) as analog baseband signal.), the selected frequency is approximately zero cycles-per-second (See Fig. 6B curve a, which shows the frequency of the combined signal centered at zero (approximately) after passing the filter 159.),

sampling the combined signal with a single analog-to-digital converter to provide a multiplicity of digital samples (fig.5 element 161 and 121), and

the plurality of input signals are received from a plurality of antenna (Fig. 2, antennas 107-1 ..n); and

wherein the composite signal includes a plurality of protocols associated with the plurality of received signal (Fig.4, where the inputs of 137-1 to 137-n are different (different in frequencies and bands) since they are mixed with different oscillation frequencies, f0 to n x f_0 and the term "plurality of the protocols" is interpreted as different frequency bands (page 2 lines 1-2 of the instant application).)

Kawanabe discloses all of the subject matter as described in the above paragraph except for specifically teaching a composite signal and providing the multiplicity of digital samples to a plurality of digital bandpass filters.

However, Lim teaches a composite signal (Fig.6 elements 90 and 97, where since the system can be processed as QPSK receiver, it is inherent that the shifted signals are composite signals) and providing the multiplicity of digital samples to a plurality of digital bandpass filters (fig.8 element 813) in order to reject noise and interference outside of the digital IF bandwidth (Fig.5 elements 70, 72-74 and column 4 lines 8-29, where the digital bandpass filter, FIR filter, is used to filter the received digital signal to the assigned frequency assignment output, 0FA, 1FA and 2FA, respectively.) in order to select a suitable power level to the assigned frequency bands (column 9 lines 34-47), respectively, so that the communication quality can be improved. Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include the digital processor sections with bandpass filters and downconverter section as taught by Lim to replace each individual spreading demodulation portion 127-1 to 127-n of Kawanabe's receiver so as to reduce the interference and improve communication quality.

Kawanabe and Lim disclose all of the subject matter as described above except for the method written by a software program embodied in a machine-accessible medium.

However, Langberg et al. teaches that the method and apparatus for a transceiver warm start activation procedure with precoding can be implemented in software stored in a computer-readable medium. The computer-readable medium is an electronic, magnetic, optical, or other physical device or means that can be contain or store a computer program for use by or in connection with a computer-related system or method (column 3, lines 51-65). One skilled in the art would have clearly recognized that the method of "Kawanabe and Lim" would have been implemented in a software. The implemented software would perform same function of the hardware for less expense, adaptability, and flexibility. Therefore, it would have been obvious to have used the software in "Kawanabe and Lim" as taught by Langberg et al. in order to reduce cost and improve the adaptability and flexibility of the communication system.

5. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over "Lim (US 6,819,706)" and Langberg et al. (US 5,852,630) as applied to claim 18 above, and further in view of Lindquist et al. (US 6,373,909).

- With regard claim 21, Lim discloses all of the subject matter as described in the above paragraph except for specifically teaching receiving the plurality of digital signals at an interference canceller.

However, Lindquist et al. teaches receiving the plurality of digital signals at an interference canceller (Fig.1 element 130 and column 3 lines 1-18) in order to remove knowledge interference from IF signal so as to

avoid the undesirable extraneous DC offset voltages (column 3 lines 12-18). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include the interference canceller as taught by Lindquist et al. into Lim's digital downconverter circuit 70 between ADC 71 and digital processor, 0FA, 1FA, and 2FA (Fig.5) so as to avoid the undesirable extraneous DC offset voltages.

6. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over "Lim (US 6,819,706)" and Langberg et al. (US 5,852,630) as applied to claim 18 above, and further in view of Casabona et al (US 5,872,540).

- Claim 23, Lim discloses all limitation as described in the above paragraph except for specifically teaching an active channel controller to adjust a sampling rate associated with the analog-to-digital converter.

  However, Casabona discloses an active channel controller to adjust a sampling rate associated with the analog-to-digital converter (col. 15, lines 13-14). Because the capability of adjusting the sampling rate increases the accuracy and efficiency of the receiver, it would have been obvious to one skilled in the art at the time of invention to incorporate the sampling rate adjustment as disclosed by Casabona into the invention of Lim.

Allowable Subject Matter

7. Claims 2, 3, 6, 7, 9, 10, 25, 27 and 28 are allowed.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ted M. Wang whose telephone number is 571-272-3053. The examiner can normally be reached on M-F, 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on 571-272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Ted M Wang/
Primary Examiner, Art Unit 2611